

2.2.4 Transportation

Solid radioactive waste is currently transported on the Hanford Site by truck. The site has reactivated its rail system. Shipment of waste by rail may require constructing a spur or developing intermodal transfer capability from the existing rail lines, and if such construction and capability is proposed it would be evaluated under future NEPA reviews. Section 4.8.5 provides additional information on the Hanford transportation system features. Section 5.8 (Volume I) and Appendix H (Volume II) provide additional information on rail shipments.

2.2.4.1 Transportation Overview

About 300 million hazardous material^(a) shipments (DOT 1998) occur in the United States every year. About 3 million (1 percent) of these involve shipments of radioactive material.^(b) Currently, less than one percent of the 3 million radioactive material shipments are DOE shipments (NEI 2003). The number of LLW and MLLW shipments is expected to rise over the next five years. The number of shipments expected to be received at Hanford as part of the proposed action is addressed in the environmental impacts analysis (Section 5.8 and Appendix H). The annual peak number of DOE radioactive material shipments is expected to increase due to HLW, TRU waste, and spent nuclear fuel shipments and due to acceleration of cleanup activities. However, acceleration of cleanup activities would not change the total number of shipments. In addition, the annual number of DOE radioactive material shipments would continue to be small in comparison to the total number of hazardous material shipments nationwide.

Even though the number of DOE shipments will continue to be relatively small, DOE shipments would represent a large amount of the radioactivity being shipped. Of DOE's radioactive materials, LLW, MLLW, and TRU waste will account for about 90 percent by volume, but less than 6 percent by radioactivity. The bulk of the radioactivity is in HLW and SNF.

2.2.4.2 Transportation Regulations

Shipment of hazardous materials is regulated by the U.S. Department of Transportation (DOT). The DOT regulations for shipping hazardous materials can be found in the Hazardous Material Regulations (49 CFR 106-180), the Federal Motor Carrier Safety Regulations (49 CFR 390-397), and NRC regulations for Packaging and Transportation of Radioactive Material (10 CFR 71). Other regulations and requirements for the shipment of radioactive materials can be found in DOE's Radioactive Material Transportation Practices (DOE 2002b).

These regulations address many specific subjects including the following:

- shipper and carrier responsibilities
- planning information

(a) For the purposes of this transportation discussion, hazardous materials include items that present chemical hazards, radioactive hazards, and physical hazards (e.g., compressed gases).

(b) Radioactive materials include radioactive waste.

- routing and route selection
- notifications
- shipping papers
- driver qualifications and training
- vehicles and required equipment
- equipment inspections
- labeling (information on containers)
- placarding (information on the shipping vehicle)
- emergency planning
- emergency notification
- emergency response
- security.

States have also established regulations consistent with DOT regulation. These regulations vary from state to state and typically address permitting, licensing, notification, determination of routes, financial liability, and inspection. Many states require transportation permits for radioactive materials. Some examples of state regulations can be found in:

- Oregon Administrative Rule 740-100, Vehicles: Driver: Equipment: Equipment Required and Condition of Vehicles (OAR 740-100)
- Oregon Administrative Rule 740-110, Transportation of Hazardous Materials (OAR 740-110)
- WAC 246-231, Packaging and Transportation of Radioactive Materials
- WAC 446-50, Transportation of Hazardous Materials.

Packaging – The type of package required depends, in part, on the total quantity of radioactivity, the form of the materials, and the concentration of radioactivity. DOE is responsible for determining the appropriate container for the material it is transporting. DOE ensures that each package containing hazardous materials meets DOT regulations for design, material, manufacturing methods, minimum thickness, tolerance, and testing.

Labeling and Placarding – Labels are required on each container to indicate the type of hazardous material in the container. Placards are used on vehicles transporting hazardous materials to indicate the type of hazardous material being transported. Labels and placards are used, in part, to assist emergency responders in case of an accident.

Driver Qualifications – Drivers of all hazardous materials, including radioactive materials, must be trained in accordance with DOT regulations. Most radioactive waste shipments require specific driver training on emergency response procedures appropriate for the materials being carried.

Routing – In general, the carrier selects the shipping routes for highway shipments of most hazardous materials in accordance with DOT regulations. Routes are selected to minimize risk with consideration to such factors as distance of shipment, accident rates, time in transit, population density, time of day, and day of the week. Most radioactive waste is transported along the interstate highway system.

Notification – DOE notifies affected states regarding shipments of spent nuclear fuel, HLW, and TRU waste. States are generally not notified about shipments of LLW and MLLW. DOE does not notify states about shipments of classified materials. When notifications are made to states, they are usually also made to affected tribal authorities.

Emergency Preparedness – Local, state, tribal, and federal governments and carriers all have responsibility for preparing for and responding to transportation emergencies.

Local or tribal personnel typically are the first responders and incident commanders for offsite transportation accidents. The *Emergency Response Guidebook* (DOT 2000) provides information to assist potential first responders to the scene of a transportation accident involving hazardous materials, including radioactive waste. Although many local jurisdictions have special hazardous material response units, most seek state or federal technical assistance during radiological incidents.

State and tribal governments have primary responsibility for the health and welfare of their citizens and therefore have an interest in ensuring the safety of shipments of hazardous materials, including DOE-owned materials, within their boundaries. Some states maintain specialized emergency response units capable of responding to radioactive material incidents in support of local authorities.

The Federal Emergency Management Agency (FEMA) is responsible for the federal government's emergency response activities. These activities are coordinated through a Federal Radiological Emergency Response Plan developed by FEMA and 11 other federal agencies. FEMA also provides assistance and evaluates state and local preparedness for radiological emergencies.

DOT has established requirements for reporting transportation accidents involving radioactive materials and has a comprehensive training program on handling emergencies involving radioactive materials shipments.

Carriers are required to notify the National Response Center (operated by the U.S. Coast Guard) of all releases of hazardous substances that exceed reportable quantities or levels of concern. Certain transportation incidents involving hazardous materials must also be reported to the National Response Center immediately including those where

- a person is killed
- a person receives injuries that require hospitalization
- property damage exceeds \$50,000
- radioactive materials are released
- major roads are closed.

The DOE Manual (DOE 2002b) expands these criteria and requires notification to the states.

DOE operates a Radiological Assistance Program (RAP) with eight Regional Coordinating Offices staffed with experts available for immediate assistance in offsite radiological monitoring and assessment. DOE RAP teams assist state, local, and tribal officials in identifying the material and monitoring to determine if there is a release and with general support.

Consistent with the DOE Manual (DOE 2002b), DOE has developed the Transportation Emergency Preparedness Program to assist federal, state, tribal, and local authorities to prepare for transportation accidents involving radioactive materials. That assistance includes planning for emergencies as well as training for emergencies. For example, through education programs offered to state and tribal organizations, over 17,000 emergency response personnel in twenty states have been trained to respond to accidents involving radioactive material (Westinghouse 2001). See <http://www.em.doe.gov/otem> for additional information about TEPP.

Like private-sector shippers, DOE must provide emergency response information required on shipping papers, including a 24-hour emergency telephone number. Shippers have overall responsibility for providing adequate technical assistance for emergency response.

Carriers are required to provide emergency planning, emergency response assistance, liability coverage, and site cleanup and restoration. DOE's policy is to respond to requests for technical advice with appropriate information and resources.

Specific information regarding local emergency preparedness can be found through Local Emergency Planning Committees (LEPCs) or State Emergency Response Commissions (SERCs).

2.2.5 Pollution Prevention/Waste Minimization

Consistent with the requirements and guidance of several laws and executive orders, including the Pollution Prevention Act of 1990 (42 USC 13101), DOE performs pollution prevention and waste minimization activities in the work it does. Pollution prevention is defined as the use of materials, processes, and practices that reduce or eliminate the generation and release of pollutants, contaminants, hazardous substances, and wastes into land, water, and air. Pollution prevention includes practices that reduce the use of hazardous materials, energy, water, and other resources along with practices that protect natural resources through conservation or more efficient use. Within DOE, pollution prevention includes all aspects of source reduction as defined by the EPA, and incorporates waste minimization by expanding beyond the EPA definition of pollution prevention to include recycling.

Pollution prevention is achieved through:

- equipment or technology selection or modification, process or procedure modification, reformulation or redesign of products, substitution of raw material, waste segregation, and improvements in housekeeping, maintenance, training or inventory control